Journal of Conventional Weapons Destruction

Volume 7
Issue 3 *The Journal of Mine Action*

Article 42

October 2003

The Cost Capture Issue in Humanitarian Mine Action

Robert Keeley
Imperial College London

Research, Development and Technology in Mine Action
focus features notes editorial journal maic
Issue 7.3, December 2003

The Cost Capture Issue in Humanitarian Mine Action

The necessity of cost capture is often overlooked in the mine action community. A truly successful cost assessment must include clear and effective cost-capture mechanisms and even a standard structure used throughout different mine action programs.

by Robert Keeley, *Imperial College London*

Introduction

One issue that has been found in the observation of mine action programs is that of incomplete cost capture in assessing the cost of units of output. For example, not including the cost of expatriate technical assistance in a cost benefit analysis (CBA)[1] lowers the apparent cost of demining programs and hence makes them look more cost-effective than they actually are. Similarly, it seems appropriate to include the cost of machines in cost-capture assessments—even where donated—in order to assess the true effectiveness of their provision compared to the cost.

Failure to capture costs may also have allowed demining programs to set low prices for services they have provided to client organisations as an extension of their core activities.[2] The rationale for programs doing such work is that it generates cash for supporting their other "humanitarian" projects and thus develops mechanisms for future sustainability. However, if the true cost of those demining services is not captured, it may have been that the returns were actually too low to justify this activity. It may have been more appropriate to (a) raise prices to reflect true costs or (b) forgo the opportunity to carry out the commercial work and concentrate on the core activities of the organisation.[3] The knock on results of inaccurate cost capture could include:

- A lack of future emphasis on ensuring cost effectiveness if the project is already seen as being "profitable."
- A reduction in the perceived need for targeting of effort on the most valuable land, leading to a possible failure to optimise use of scarce resources.
- An inability to assess the impact and costs of technical assistance if they are not included in the cost capture process.
- An inaccurate comparison with the costs of demining services provided on contract.

Aim

Clear and effective cost-capture mechanisms should also assist donors in the evaluation of different mine action programs, as they will establish a "level playing field" that will allow the comparison of the different programs. The aim of this paper is to set out some possible structures for a cost-capture standard and consider some of the problems with its implementation, in the hope of generating discussion on this issue.

The Elements of a Humanitarian Mine Action Program

An integrated humanitarian mine action program[4] tends to consist of the following core productive elements:

- An area clearance capacity, used to search and dispose of any landmines or UXO in an area suspected of being contaminated. The capacity tends to be divided into different teams, which may deploy in several different locations at the same time.

Once deployed, such teams may work on the same task site for several months until it is cleared.
- A mobile explosive ordnance disposal (EOD) capacity that is capable of travelling around the countryside to deal with any items of UXO that are reported by the public. The mobile capacity may be divided into a number of small teams capable of responding to several tasks in one day.
- A community awareness capacity capable of providing mine risk education (MRE) to the population in and around affected areas.

Any program will also have the support elements set out in Table 1. As none of these will directly generate any "output" they could be considered as overheads for the program. Their cost could therefore be divided among the productive elements (see below).

• Management • Planning • Database/geographic information system (GIS)	• Administration • Logistics • Training • Quality assurance

Table 1: Mine action program support elements.

Cost Capture of Productive Elements

The items in Table 2 make up the main costs incurred directly by the productive elements. Their proportion will vary depending on the service being provided. They can also be divided into standard definition of fixed and variable costs, with consumables and the operation and maintenance (O+M) costs making up the variable costs.

• Capital cost of equipment used by teams (divided by expected working life to get annual cost) • Infrastructure (accommodation, parking, office space) rental and utilities • Salaries of local personnel included in teams	• Other personnel costs including food and accommodation, allowances and insurance • Consumables • Operation and maintenance of equipment used by teams • Share of overhead costs

Table 2: Typical mine action program costs incurred by productive elements.

This raises the need to define what comprises a "productive element." For example, demining teams have medics and drivers; teams may have a team leader; and teams may be grouped together under a site manager. None of these people actually "demine" themselves. Similar divisions of labour exist in EOD and MRE teams, and many demining programs also have a number of regional offices that are not part of the national headquarters. There may be many ways this could be addressed. One simple method would be to use the divisions between "single tasking" and "multi-tasking" and between "field" and "staff" as a means of allocation. For example, all personnel engaged in a single task (i.e., members of an EOD team) are costed as personnel engaged in that task, whereas all personnel in staff or support positions (including regional offices) are costed as overheads.

Treatment of Survey Teams

One area where the division between "productive" and "overhead" is not immediately clear is that of survey. There are a number of survey processes, from the impact surveys that are analogous to surveys carried out in other development sectors, to technical surveys that are used to determine the extent of physical contamination.[5] For cost capture, it is possible to divide them as follows:

- All surveys that reduce the boundaries of suspected contamination, thus releasing land previously regarded as mined for immediate use, should be considered as

productive area clearance techniques.[6]

- All techniques that are used as a means of probing mined areas to gain information on the content of the mined areas, or to prepare the work site for subsequent clearance, are part of the area clearance process and their cost should be attributed accordingly.
- All other surveys that are used to assess the overall impact and extent of contamination as part of the planning process and their cost should be treated as planning overhead.

Division of Overheads Among Productive Elements

Being able to divide overheads among the different productive elements provides the means to establish the price of the products of the demining program. This has two other main advantages. First, it allows services provided by the program to be compared with similar services provided by other agencies. Second, it allows the costs of the different services provided by the program to be compared with each other.

In order to divide overheads among the different productive elements, there is a need to choose the unit of allocation. The four main choices are as follows:

- **Per team**: There are too many differences between "teams" providing the same services in different programs. For example, a mobile team in Cambodia may consist of three personnel, whereas in Laos, a team of around eight personnel provides a similar service. This makes it difficult to compare costs between programs.
- **Per unit of output**: While it is necessary to establish the price of a particular service, it is not yet possible to compare units of output (e.g., the value of a square metre of cleared land with the value of a "unit" of MRE). This suggests that the unit of output is not the best way to divide the cost of overheads.
- **Per person**: This would involve a simple calculation. If a program has 100 people engaged in demining with 10 in EOD, 10 in MRE and 20 in support, the cost of the support would be divided among the three productive elements (i.e., in the ratio 100:10:10). While this is probably a blunt tool, it does not suffer the same disadvantages of the two alternatives above and is perhaps a reasonable measure of the effort being extended by the organisation. However, it does not allow for programs that are not so personnel-intensive.
- **Per share of budget**: This shares the advantages of the "per person" above and automatically adjusts for programs that are more or less personnel intensive. In the same structure above, if the three components had budgets of $500K (U.S.), $200K and $200K, the cost of overheads would be charged on the ratio of 5:2:2. This is, therefore, the recommended option.

Expatriate Technical Assistance

In the particular case of expatriate technical assistance, failure to capture this item may introduce bias against more mature programs that have reduced dependency on expatriate technical assistance.

The allocation of technical assistance services could follow the same principles as used for other overheads. In other words, the cost of technical assistance provided specifically for the operation of EOD teams would be included in the cost of EOD teams, the cost of technical assistance provided to operate machines would be included in the cost of area clearance and the cost of "technical assistance" provided to maintain the organisation's database would be an overhead cost that would be divided among the productive elements.

The inclusion of technical assistance in cost capture might encourage the efficient use of such services—and the prompt removal of them when no longer necessary. There may by a residual requirement, depending on donor practices, to maintain a limited presence over the length of the donation in order to help ensure financial probity. This residual requirement is akin to the "technical assistance" provided in standard development projects and may be considered as a transaction cost of the donor and, perhaps, not included in the program costs.

Dealing With Multiple Accounts

In order to ensure that programs are properly costed, this process should be carried out even where the funds are in multiple accounts that may be "ringfenced" or otherwise inaccessible to program managers (e.g., assistance that is provided in kind to the program). For example, if a budget of $10,000,000 did not include the cost of $1,000,000 for providing machinery, provided as an "in kind" contribution, the organisation would be able to externalise some of the costs of mechanisation, the apparent cost would not reflect true costs and it would give an erroneously favourable comparison with other agencies.

Other Expenditure by Donors

Other expenditures by donors that do not directly contribute to mine action programs, such as funding conferences or campaigns, should not be attributed as donations to specific mine action programs (though the donor may well attribute them as contributions to "mine action" in general). This includes research and development (R&D), except where R&D is recovered by inclusion in the market price of technology placed on the open market. An example of this would be a donor purchasing a machine developed by a private company on behalf of a program. As described above, the market price of the machine should be included in the calculations as an "in-kind contribution," and it is assumed that the manufacturer has included an element of R&D costs as part of the cost recovery calculations set in establishing the price of the machine. There is some risk of "dumping" technology at a less-than-market price (which would make the machine appear more cost-effective than it is), but this is unlikely unless the machine was not purchased on the open market. At any rate, it may be that the donor would rather exaggerate than underestimate a contribution.

Example

Fictional organisation consists of 850 personnel with:

- 52 employed in HQ*
- 72 employed in four regional offices*
- 34 employed at a training centre*
- 20 trainees*
- 600 employed in demining teams, divided into 25 teams
- 12 employed in four QA teams*
- 30 employed in 10 EOD teams
- 30 employed in MRE

This organisation has an annual budget of $10,000,000, divided as follows:[7]

Demining cost (not including overheads)	-$5,500,000
EOD cost	-$600,000
MRE cost	-$500,000
Overheads	-$3,400,000
Total	-$10,000,000

Overhead costs, marked in the table above with an asterisk (*), would be allocated according to the ratio 55:6:5.

Costs (with allocation):

Demining cost (including overheads)	-$8,300,000
EOD cost	-$900,000
MRE cost	-$870,000

Total	-$10,000,000

- If annual demining output equals 4,125,000 sq m per year.[8]
- Therefore the apparent cost of cleared area equals $5.5 million/4.13 million sq m equals $1.33/sq m.
- Whereas true cost of cleared area equals $8.3 million/4.13 million km equals $2.01/sq m.[9]

Sensitivity Analysis

The model is clearly very sensitive in absolute terms to the variations in productivity, salaries and other costs, and it would still not be possible to carry out clumsy "apples and oranges" comparisons of programs in different countries.[10] However, variation of all such figures still leaves a clear demonstration that proper consideration of overheads in pricing will considerably affect the unit cost of demining.

The Prisoners' Dilemma

The term "prisoners' dilemma" is based on the following scenario: two prisoners are arrested and questioned separately. If they both keep silent, they both go free. On the other hand, if one talks, he gets a reduced sentence while the other one gets the full punishment…and he knows his partner has the same options. What do they do?

Economists often use a model called the "prisoners' dilemma"[11] to model the risks of compliance and non-compliance with such things as treaties regulating pollution. In this case, it can be represented thus: Imagine two different mine action programs appealing to a donor for funding. There is a limited amount of funding available and the donor has a policy of supporting "cost effectiveness." Both programs are identical in terms of socio-economic benefit they generate and are equally compliant with the international codes of practice set out in the International Mine Action Standards (IMAS). However, there are no IMAS provisions for cost capture; thus, the programs have a choice about how they present their costs. Their options are as follows:

- Option 1: Use existing accounting processes and do not allocate overhead costs to demining.
- Option 2: Reform accounting processes and allocate overhead costs to demining.

		Program A	
		Option 1	**Option 2**
Program B	**Option 1**	Status quo	B "wins"
	Option 2	A "wins"	Better overall understanding

Table 3: The prisoner's dilemma of mine action cost capture.

If both programs opt for full cost capture, the demining community benefits overall; however, if one program adopts it unilaterally, it risks appearing more expensive than the other. The likely result of this situation is that both programs might—all other things being equal—retain any existing accounting practices that made them appear more cost effective if they believed that they were in competition with other demining programs. A similar logic could have been applied to the provision of personal protective equipment (PPE). Before there were clear standards on the requirement for PPE, programs were left with the choice to provide or not: programs that did comply would be more expensive. However, the introduction of a standard for PPE in IMAS has reduced the risk of this problem. There may therefore be an argument for a similar standard for cost capture protocols for mine action programs.

Conclusions

A cost capture process appears necessary if the strategic planning of mine action is to

accurately measure the true costs of demining programs. This will become particularly important when planners (and donors) attempt to measure the effectiveness of new technologies, such as machines. Nevertheless, there appears to be little incentive for programs to adopt such procedures unilaterally.

Standardisation is a complicated matter and an issue that is always fraught with sensitivity. However, if there is no standard for cost capture, there is a potential risk for programs that attempt to adopt such cost-capture processes unilaterally.

Given a desire to increase real cost effectiveness and properly consider the potential impact of dogs, machines and other new technology, there is a need to consider the introduction of a standard of cost capture as a "best practice" for mine action programs in order to safeguard those programs that are truly working hard to improve cost effectiveness.

**Comments on this article would be greatly appreciated and should be directed to the author.*

Endnotes

1. See examples of CBA in GICHD document "A study of Socio-Economic Approaches to Mine Action." The notes explain the difficulties faced by the authors in identifying all of the relevant costs.
2. For example, the Cambodian Mine Action Centre (CMAC) has operated a demining for cash service for construction projects that were normally outside its mandate.
3. It is difficult to pronounce with certainty, as the accounting processes in use at the time were not developed enough to allow such detailed analysis (based on KPMG audit of CMAC in 1999). Of course, one cannot blame programs retrospectively for not including cost-capture processes in their accounting procedures in the past, if there was no requirement for them to do so at the time.
4. Based on a joint policy statement by three demining NGOs in 1997: Handicap International, Mines Advisory Group and Norwegian Peoples Aid. This narrower definition does not include the wider related activities such as anti-landmine advocacy that is included in later definitions (such as those in IMAS), which are less directly relevant to the issues covered in this paper.
5. See IMAS for the latest definitions of mine action surveys.
6. This assumes that land released by such activities is just as clear as land cleared by "clearance" procedures.
7. Costs have been rounded for simplicity. The costs are based in generic costs in SE Asia and do not reflect any one particular program or project.
8. Based on 25 teams working for 21 days in 11 months and each clearing 1.5 ha (150,000 sq m) per month.
9. For the sake of simplicity, this price calculation does not include any allowance that might be made to offset the effect of a discount rate on up-front investments. Application of a discount rate would tend to increase both costs, with more of the additional cost being borne by the demining program element, especially where machines are part of the up-front cost.
10. However, use of a standard cost-capture mechanism would remove variables and would facilitate accurate comparison. For example, in two otherwise identical programs, it would be easy to chart the effect of differences in salaries if a standard cost-capture mechanism were used in the comparison.
11. For more detail, see the explanation at the following website: http://william-king.www.drexel.edu/top/eco/game/dilemma.html.

Contact Information

Robert Keeley
Imperial College London
Wye Campus
Ashford
KENT
United Kingdom
Tel: +44 (0) 1233 663023
Mobile: +44 (0)7788 585828
E-mail: BobKeeley@compuserve.com